



The rediscovery of *Brownlowia tersa* (L.) Kosterm. (Malvaceae), from the Andaman Islands, India — a Near Threatened mangrove species

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Abstract: *Brownlowia tersa*, described by C.E. Parkinson from the Andaman Islands during the 1920s, was never recollected. The present report concerns its recent collection from North Andaman and Middle Andaman Islands with updated nomenclature, detailed description and distribution notes. It is considered a near threatened species due to habitat loss.

Key words: Andaman Island; *Brownlowia tersa*; India; rediscovery

The genus *Brownlowia* Roxb., of the family Malvaceae, is comprised of about 30 species and is widely distributed in Southeast Asia through Malaysia and the Pacific Islands (Tomlinson 1986). Two species, *Brownlowia tersa* and *B. argentata*, are known from mangrove communities and are classified as true mangrove species (Duke 1992; Giesen et al. 2006; Polidoro et al. 2010). *Brownlowia tersa* was first reported from the Andaman and Nicobar Islands (ANI) from Dhani Khari Creek, Middle Andaman, by Parkinson (1923, as *B. lanceolata*). Subsequently, *B. tersa* was reported by Sahni (1958), Das and Dev Ray (1989), Dagar et al. (1991), Dagar and Singh (1999), Debnath (1999) and Debnath (2004) but without locality data and detailed description. Debnath (1999) and Debnath (2004) noted that about 80 years earlier, *B. tersa* reportedly was abundant nearer to the large creeks of Middle Andaman and Dhanikahri Creek but had been rarely observed there recently. Venu et al. (2006) also noted that there were no recent collections of *B. tersa* from the ANI and that it may have been extirpated

from the ANI. From these publications it is apparent that the precise locality of *B. tersa* in the ANI remained unknown despite many authors mentioning its distribution there. Here, we discuss taxonomy and distribution of *B. tersa* in the ANI, India.

Recent floristic study on species diversity and distribution of mangroves of the ANI revealed the occurrence of *B. tersa* in Shyamkund Creek (Middle Andaman) and Kalighat Creek (North Andaman) (Figure 1). Specimens were collected for assessing the numeric and multistate attributes of a wide range of vegetative and reproductive morphological characters and were identified using standard references (Parkinson 1923; Tomlinson 1986; Giesen et al. 2006). Collected specimens were also compared with electronic resources such as the Angiosperm Phylogeny Website (Stevens 2001), Tropicos of Missouri Botanical Garden, REMIB (World Biodiversity Information Network), Kew Herbarium Database, Global Plants Initiative, ePIC (electronic Plant Information Centre 2002), and IPNI (The International Plant Names Index 2012). Voucher material of *B. tersa* was deposited at the National Botanical Collection of Andaman and Nicobar Regional Centre, Botanical Survey of India, Port Blair.

Brownlowia tersa (L.) Kosterm. Kosterm, A.J.G.H. 1959. Penerbitan Madj. enget. Indonesia 1: 73. (Figures 2–9)

Brownlowia beccarii (Mast.) Pierre — Pierre, J.B.L.188. Fl. Forest. Cochinch. t. 130.

Brownlowia lanceolata Benth. — Bentham, G. 1861. J. Proc. Linn. Soc., Bot. 5(Suppl. 2): 57.

Dialycarpa beccarii Mast. — Mast. 1875. Linn. Soc., Bot. 14: 506.

Glabraria tersa L. — Linnaeus, C. 1771. Mant. Pl. 2: 276.

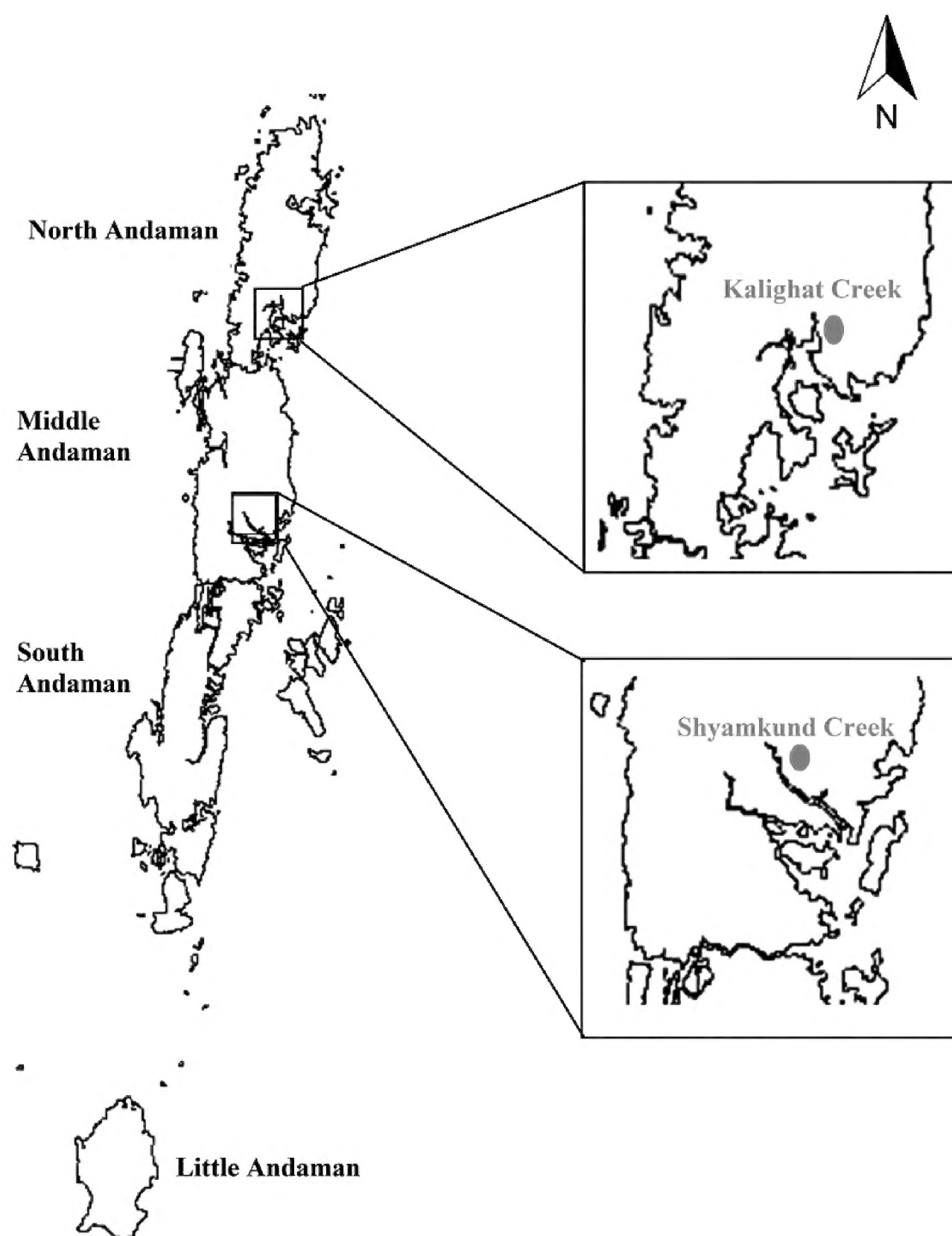


Figure 1. Map showing study area. Red spots indicate localities of *Brownlowia tersa*.

Specimens examined. India, Andaman and Nicobar Islands, Middle Andaman, Shyamkund Creek, 13 March 2014 (12°28'33.86" N, 092°50'37.6" E), P. Ragavan, PBL 30987 and 30988.

Description. *Shrub*: spreading, height to 2 m (Figure 2). *Roots*: no above ground roots. *Branches*: grey and smooth, small braches often pubescent; *Leaves*: lanceolate (Figure 3), apex pointed, base rounded, 5–20 × 2–5 cm, ratio of length to width >2, underside silvery grey (Figure 4), above glossy green in colour; petiole small, 1–2 cm long, grey in colour. *Inflorescences*: terminal or axial, few flowered, up to 4 cm long (Figure 8). *Mature flower bud*: rounded, 0.4–0.6 cm long (Figure 7); calyx, brown, 0.5 cm long, 3–5 lobed, bell shaped (Figure 6); petals 5, yellowish or pink in colour (Figure 5), 0.3 × 0.2 cm, apex rounded; stamens numerous with yellow anther (Figure 4). *Mature fruits*: woody capsule, heart shaped, up to 1.5 cm long, grayish green in colour, covered with small, brown warts (Figure 9), single seeded.

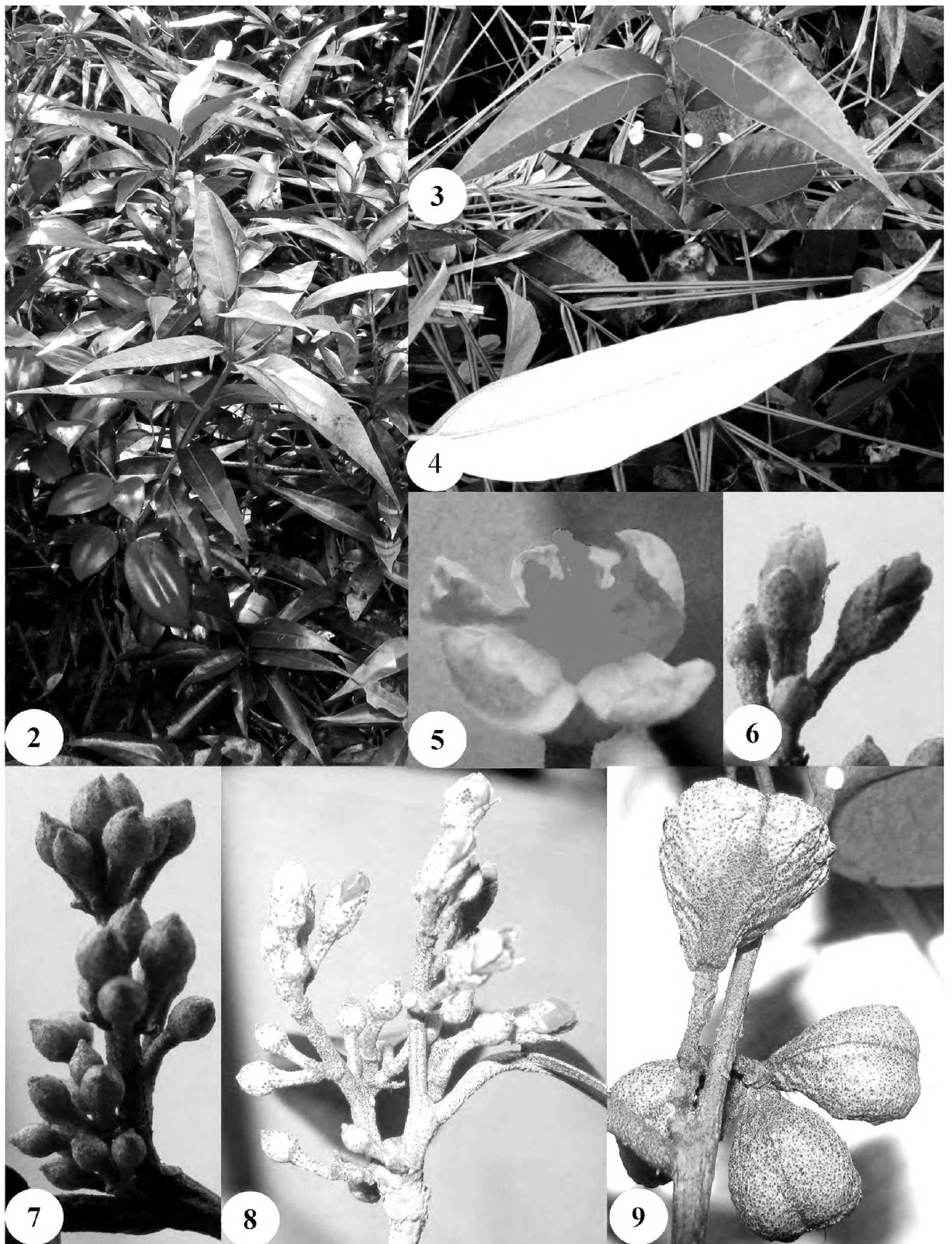
Distribution. Rare; North and Middle Andaman islands.

Habitat and ecology. Found on the soft mud of intertidal estuarine banks along with *Rhizophora* and *Bruguiera* species; forms dense thickets.

Phenology. Flowering February to March; fruiting April to July

Conservation status. Categorized as Near Threatened by the IUCN (Kathiresan et al. 2010).

This study reports the occurrence of *B. tersa* from the ANI after lapse of 92 years. *Brownlowia tersa* can be readily recognized in the field by its brown-scaly twigs, lanceolate leaves with dull silvery under surface and pear-shaped, 2-valved fruits. *Brownlowia tersa* distinguished from *B. argentata* by its shrubby habitus and lanceolate leaves, (vs. medium sized tree and cordate leaves in *B. argentata*). It often grows along the banks in stands and remains nearly half submerged during high tide, withstanding the tidal surge by its



Figures 2–9. Morphological characters of *Brownlowia tersa*. **2:** Habitat. **3:** Lanceolate leaves. **4:** Silvery grey underside of the leaf. **5:** Flower with numerous stamens and petals. **6:** Calyx. **7:** Flower buds. **8:** Inflorescences. **9:** Mature fruits.

intricate root system. Globally, *B. tersa* is considered as a true mangrove species (Duke 1992; Giesen et al. 2006; Polidoro et al. 2010), but it has not been added to the mangrove flora of India in some important national and international status reports (Kathiresan and Bingham 2001; Kathiresan and Rajendran 2005; Anonymous 2008; Mandal and Naskar 2008). In ANI only, Sahni (1958) and Debnath (2004) classified it as true mangrove species but without locality data.

Brownlowia tersa is categorized as Near Threatened by the IUCN (Kathiresan et al. 2010; Polidoro et al. 2010). This species is threatened by habitat loss from coastal development, erosion, and the construction of shrimp and fish ponds throughout its range (Kathiresan et al. 2010). It is common in Southeast Asian countries: Bangladesh, Brunei, Cambodia, Indonesia Malaysia, Myanmar, Singapore, Philippines and Thailand (Giesen et al. 2006). In India its distribution is restricted to the east coast and the ANI; it is not known from the west coast. Along the east coast it is common in West Bengal and Odisha but rare in the Godavari estuary of Andhra Pradesh (Venu et al. 2006; Kathiresan 2010; Bhatt et al. 2011).

This study provides the only specific locality data of *B. tersa* in the Andaman Islands in many years. Among the 51 sites surveyed in the ANI, *B. tersa* was found at only two sites (Figure 1), and it is now rare in these islands. *Brownlowia tersa* has not been reported from the Nicobar Islands. In the Nicobar Islands, mangroves are found in narrow stretches because the creeks do not penetrate as far inland as in the Andaman Islands. In addition, mangroves of the Nicobar Islands were affected badly by the tsunami of 26 December 2004 (Ramachandran et al. 2005; Sridhar et al. 2006). The absence of *B. tersa* from the Nicobar Islands may be because of these factors.

Brownlowia tersa has long been used as a traditional folk remedy for diarrhoea, dysentery, wounds and boils. Roots have been found to possess significant antibacterial ability. Leaves possess anti-inflammatory, antioxidant, analgesic and anti-diarrhoeal activities (Hossain et al. 2013). A wide range of volatile phenolic components has also been isolated from various parts of *B. tersa* (Atanu et al. 2012).

Populations of *B. tersa* are experiencing severe loss at the range margins due to human activities and coastal development. This is an endangered species in India (Gopal and Chauhan 2006), so immediate and effective conservation measures should be taken for their protection and propagation.

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